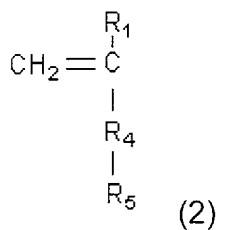
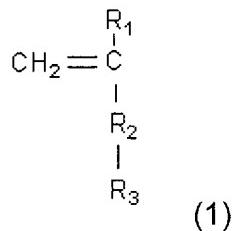


**WHAT IS CLAIMED IS:**

1. A monomer for a chemically amplified negative photoresist, which is represented by the formula 1 or 2:

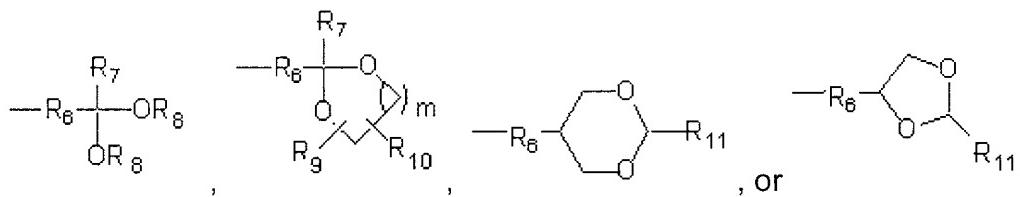


wherein:

$R_1$  is H or  $CH_3$ ;

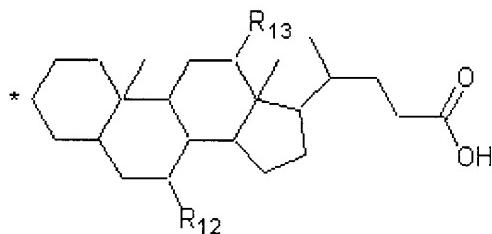
$R_2$  and  $R_4$  are each independently selected from  $(R)_\alpha(CH_2)_\beta R'$  and  $(R)_\alpha[(CH_2)_\gamma O]_\delta R'$  (wherein R is CO,  $CO_2$ , O,  $OCO$ , or  $OCO_2$ ,  $R'$  is O,  $CO_2$ , or  $OCO_2$ ,  $\alpha$  is 0 or 1,  $\beta$  is 0 to 5,  $\gamma$  is 1 or 2, and  $\delta$  is 1 to 5);

$R_3$  is represented by one of the formula:



wherein R<sub>6</sub>, which combines an acetal compound and a vinyl compound, is a C<sub>1</sub>-C<sub>5</sub> saturated alkyl, a C<sub>1</sub>-C<sub>5</sub> ether, or a C<sub>1</sub>-C<sub>5</sub> carbonyl; R<sub>3</sub> to R<sub>7</sub> are each independently selected from H, C<sub>1</sub>-C<sub>5</sub> saturated alkyls, C<sub>1</sub>-C<sub>5</sub> ethers, C<sub>1</sub>-C<sub>5</sub> carbonyl groups, and C<sub>1</sub>-C<sub>5</sub> alcohol groups; and m is a number ranging from 1-5; and

R<sub>5</sub> is represented by the formula:



wherein R<sub>12</sub> and R<sub>13</sub> are identical or each independently H or OH; and

\* represents the bonding site at which the R<sub>4</sub> group is bonded.

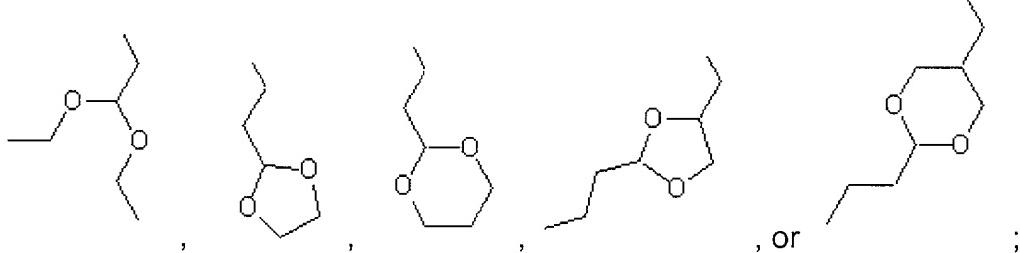
5 2. The monomer for a chemically amplified negative photoresist according

to claim 1 wherein:

R<sub>1</sub> is H;

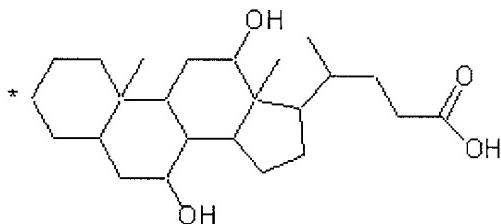
R<sub>2</sub> is CO<sub>2</sub>;

R<sub>3</sub> is



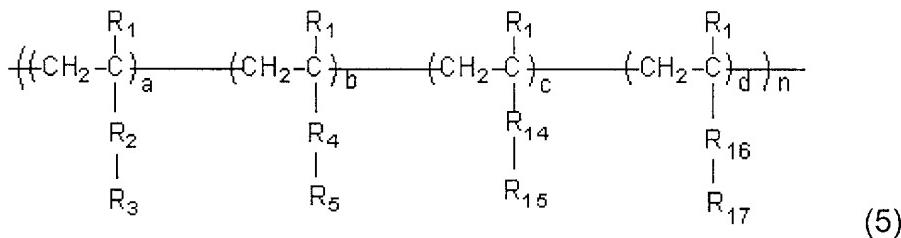
10 R<sub>4</sub> is CO<sub>2</sub>; and

R<sub>5</sub> is



3. A polymer for a chemically amplified negative photoresist, which is

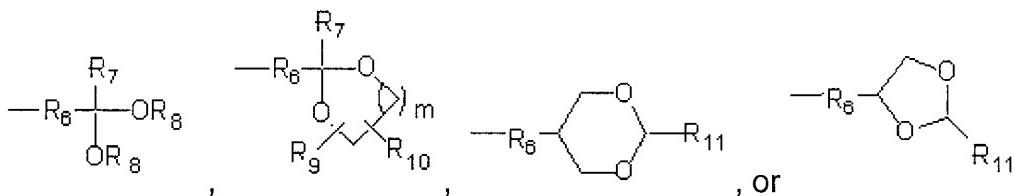
15 represented by formula 5:



wherein  $R_1$  is H or  $CH_3$ ;

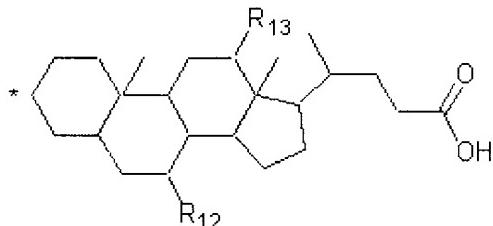
$R_2$  and  $R_4$  are each independently selected from  $(R)_\alpha(CH_2)_\beta R'$  and  $(R)_\alpha[(CH_2)_\gamma O]_\delta R'$  (wherein, R is CO,  $CO_2$ , O,  $OCO$ , or  $OCO_2$ ,  $R'$  is O,  $CO_2$ , or  $OCO_2$ ,  $\alpha$  is 0 or 1,  $\beta$  is 0 to 5,  $\gamma$  is 1 or 2, and  $\delta$  is 1 to 5);

$R_3$  is represented by one of the formula:



wherein  $R_6$ , which combines an acetal compound and a vinyl compound, is a  $C_1-C_5$  saturated alkyl, a  $C_1-C_5$  ether, or a  $C_1-C_5$  carbonyl;  $R_7$  to  $R_{11}$  are each independently selected from H,  $C_1-C_5$  saturated alkyls,  $C_1-C_5$  ethers,  $C_1-C_5$  carbonyl groups,  $C_1-C_5$  alcohol groups; and m is a number ranging from 1-5; and

$R_5$  is represented by formula:



wherein  $R_{12}$  and  $R_{13}$  are each independently selected from H and OH, and

\* represents the bonding site at which the  $R_4$  group is bonded;

R<sub>14</sub> and R<sub>16</sub> are each independently selected from a single bond, (R)<sub>α</sub>(CH<sub>2</sub>)<sub>β</sub>R' and (R)<sub>α</sub>[(CH<sub>2</sub>)<sub>γ</sub>O]<sub>δ</sub>R' (wherein R is CO, CO<sub>2</sub>, O, OCO, or OCO<sub>2</sub>, R' is O, CO<sub>2</sub>, or OCO<sub>2</sub>, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5); R<sub>15</sub> is a hydroxyl group; R<sub>17</sub> is a carboxyl group;

5 a, b, c, and d represent mole ratios of each monomer, a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that a+b+c+d = 1; and

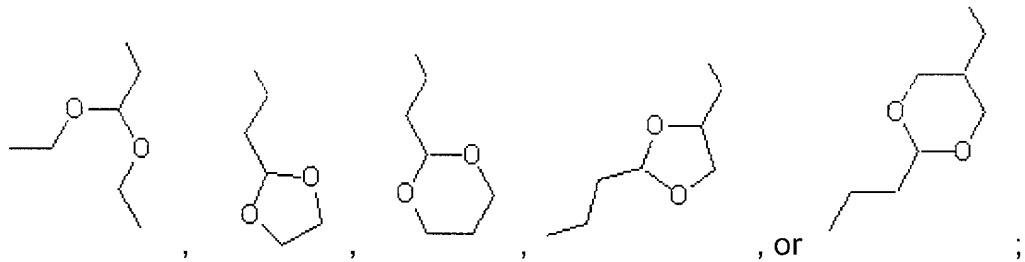
n represents the degree of polymerization of each polymer, and has a value of at least 2.

10 4. The polymer for a chemically amplified negative photoresist according to claim 3 wherein:

R<sub>1</sub> is H;

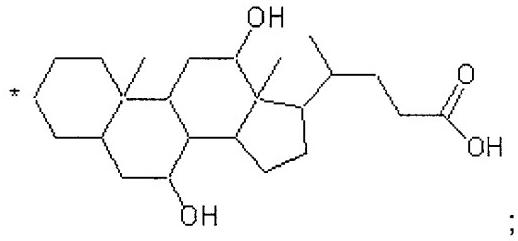
R<sub>2</sub> is CO<sub>2</sub>;

R<sub>3</sub> is



R<sub>4</sub> is CO<sub>2</sub>;

R<sub>5</sub> is



R<sub>14</sub> is CO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>,

R<sub>15</sub> is OH,

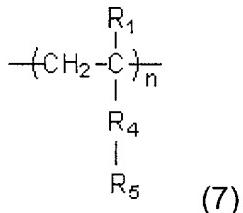
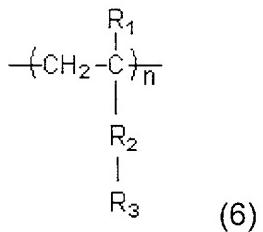
R<sub>16</sub> is a single bond, and

R<sub>17</sub> is COOH.

5 5. A chemically amplified negative photoresist composition comprising:

a photoacid generator; and

10 a homopolymer of the formula 6, a homopolymer of the formula 7, or a combination thereof;



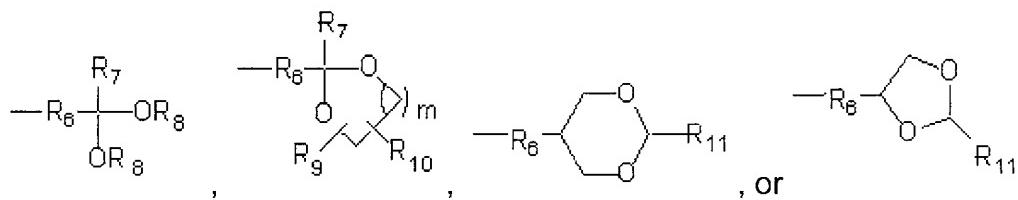
wherein R<sub>1</sub> is H or CH<sub>3</sub>;

R<sub>2</sub> and R<sub>4</sub> are each independently selected from (R)<sub>α</sub>(CH<sub>2</sub>)<sub>β</sub>R' and (R)<sub>α</sub>[(CH<sub>2</sub>)<sub>γ</sub>

15 O]<sub>δ</sub>R' (wherein R is CO, CO<sub>2</sub>, O, OCO, or OCO<sub>2</sub>, R' is O, CO<sub>2</sub>, or OCO<sub>2</sub>, α is 0 or 1, β is

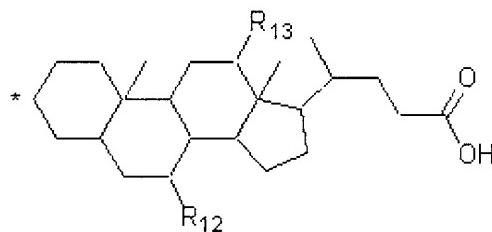
0 to 5, γ is 1 or 2, and δ is 1 to 5);

R<sub>3</sub> is represented by one of the formula:



wherein R<sub>6</sub>, which combines an acetal compound and a vinyl compound, is a C<sub>1</sub>-C<sub>5</sub> saturated alkyl, a C<sub>1</sub>-C<sub>5</sub> ether, or a C<sub>1</sub>-C<sub>5</sub> carbonyl; R<sub>7</sub> to R<sub>11</sub> are each independently selected from H, C<sub>1</sub>-C<sub>5</sub> saturated alkyls, C<sub>1</sub>-C<sub>5</sub> ethers, C<sub>1</sub>-C<sub>5</sub> carbonyl groups, and C<sub>1</sub>-C<sub>5</sub> alcohol groups; and m is a number ranging from 1-5; and

R<sub>5</sub> is represented by the formula:



wherein R<sub>12</sub> and R<sub>13</sub> are each independently H or OH;

\* represents the bonding site at which the R<sub>4</sub> group is bonded; and

n represents the degree of polymerization of each polymer, and has a value of at least 2.

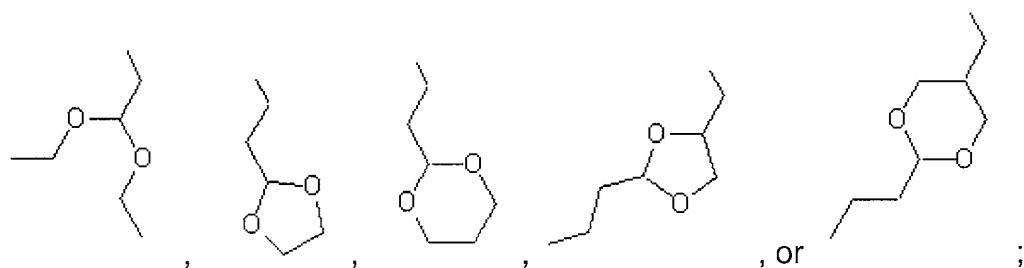
6. The chemically amplified negative photoresist composition according to claim 5 wherein the photoresist composition comprises a combination of the homopolymer of the formula 6 and the homopolymer of the formula 7.

7. The composition for a chemically amplified negative photoresist according to claim 5 wherein:

R<sub>1</sub> is H;

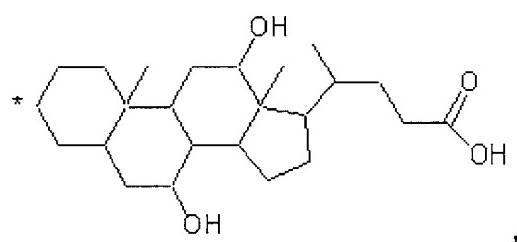
R<sub>2</sub> is CO<sub>2</sub>;

R<sub>3</sub> is



R<sub>4</sub> is CO<sub>2</sub>;

R<sub>5</sub> is



R<sub>14</sub> is CO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>,

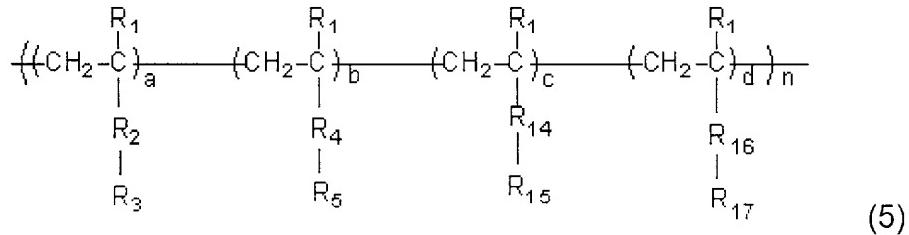
R<sub>15</sub> is OH,

R<sub>16</sub> is a single bond, and

R<sub>17</sub> is COOH.

10        8.        The chemically amplified negative photoresist composition according to  
claim 5 wherein the photoresist composition comprises 10 to 20 wt.% of the polymer  
and 0.1 to 1.0 wt.% of the photoacid generator based on the weight of the photoresist.

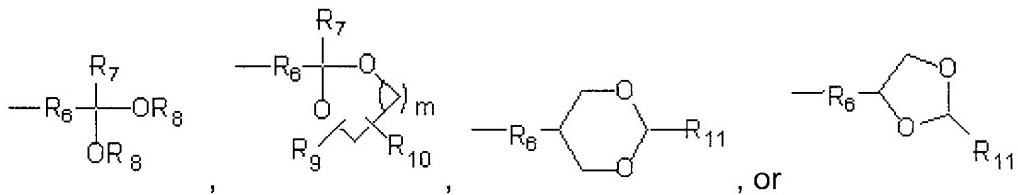
9.        A chemically amplified negative photoresist composition comprising;  
a photoacid generator; and  
15        a polymer of formula 5:



wherein R<sub>1</sub> is H or CH<sub>3</sub>;

R<sub>2</sub> and R<sub>4</sub> are each independently selected from (R)<sub>α</sub>(CH<sub>2</sub>)<sub>β</sub>R' and (R)<sub>α</sub>[(CH<sub>2</sub>)<sub>γ</sub>O]<sub>δ</sub>R' (wherein, R is CO, CO<sub>2</sub>, O, OCO, or OCO<sub>2</sub>, R' is O, CO<sub>2</sub>, or OCO<sub>2</sub>, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5);

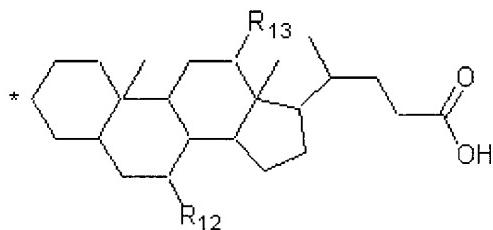
R<sub>3</sub> is represented by one of the formula:



5  
CHEMICAL EQUATIONS  
10  
15

wherein R<sub>6</sub>, which combines an acetal compound and a vinyl compound, is a C<sub>1</sub>-C<sub>5</sub> saturated alkyl, a C<sub>1</sub>-C<sub>5</sub> ether, or a C<sub>1</sub>-C<sub>5</sub> carbonyl; R<sub>7</sub> to R<sub>11</sub> are each independently selected from H, C<sub>1</sub>-C<sub>5</sub> saturated alkyls, C<sub>1</sub>-C<sub>5</sub> ethers, C<sub>1</sub>-C<sub>5</sub> carbonyl groups, and C<sub>1</sub>-C<sub>5</sub> alcohol groups; and m is a number ranging from 1-5; and

R<sub>5</sub> is represented by the formula:



wherein R<sub>12</sub> and R<sub>13</sub> are each independently H or OH; and

\* represents the bonding site at which the R<sub>4</sub> group is bonded;

15

R<sub>14</sub> and R<sub>16</sub> are each independently selected from a single bond, (R)<sub>α</sub>(CH<sub>2</sub>)<sub>β</sub>R' and (R)<sub>α</sub>[(CH<sub>2</sub>)<sub>γ</sub>O]<sub>δ</sub>R' (wherein R is CO, CO<sub>2</sub>, O, OCO, or OCO<sub>2</sub>, R' is O, CO<sub>2</sub>, or OCO<sub>2</sub>, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5); R<sub>15</sub> is a hydroxyl group; R<sub>17</sub> is a carboxyl group;

a, b, c, and d represent the mole ratios of each monomer, wherein a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that a+b+c+d = 1; and

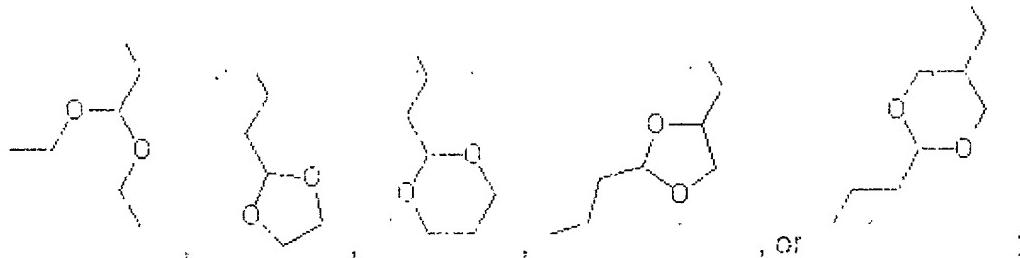
n represents the degree of polymerization of each polymer, and has a value of at least 2.

10. The chemically amplified negative photoresist composition according to claim 9 wherein

R<sub>1</sub> is H;

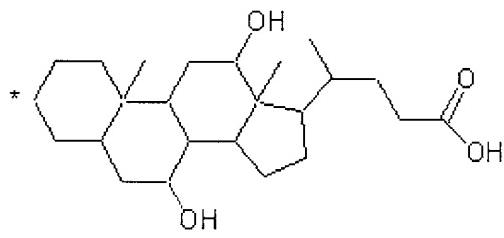
R<sub>2</sub> is CO<sub>2</sub>;

R<sub>3</sub> is



15. R<sub>4</sub> is CO<sub>2</sub>;

R<sub>5</sub> is



R<sub>14</sub> is CO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>,

R<sub>15</sub> is OH,

R<sub>16</sub> is a single bond, and

R<sub>17</sub> is COOH.

5

11. The chemically amplified negative photoresist composition according to claim 9 wherein the photoresist composition comprises 10 to 20 wt.% of said polymer and 0.1 to 1.0 wt.% of said photoacid generator.